THE AMERICAN GASTROSCOPIC SOCIETY

BULLETIN

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PRESIDENT'S PAGE

So much has transpired since last we met I should like to use this page to acquaint you with some of the more important developments.

Announcement of the Annual Meeting was sent to all members earlier and details are given elsewhere in this issue of the Bulletin. As may be seen, the program is a potpourri of gastroscopic and esophagoscopic lore. It has been constructed to meet the desires and interests of the membership as indicated in the replies to the Questionnaire which had been sent to every member. In keeping with the expressed wishes of the majority, an attempt has been made to provide informal and practical discussions of pertinent problems and newer advances in the fields of gastroscopy and esophagoscopy. At the same time, certain innovations are being attempted. It is hoped that these will prove both informative and interesting. Wide participation of the members in the program has been emphasized and audience participation will be highly encouraged.

The time of the meeting is especially convenient, coming as it does on the day between the ending of the meeting of the American Gastroenterological Association and the beginning of that of the American Medical Association. The Annual banquet will be highlighted by an especially entertaining speaker and will be preceded by the usual cocktail party. All in all, the meeting promises to be a bang-up affair!

As you know, it was arranged two years ago to have the proceedings of our scientific session published in full in Gastroenterology as a separate section of that journal. Abstracts of the papers presented were published in our Bulletin. Accumulated experience has made it clear, however, that the huge back-log of material which Gastroenterology has on hand makes it necessary for them to be highly discriminatory in the selection of material. It also imposes an inordinate delay from the date of the meeting to the time of publication. The use only of abstracts in our Bulletin diminishes the stature of this publication and serves as a strong deterrent against its official listing in the Quarterly Cumulative Index. Moreover, material for the Bulletin is difficult to come by so that the number of issues per year has necessarily been small. This has also acted as a deterrent to indexing and has discouraged advertisers from utilizing the publication.

To overcome these shortcomings, it is now proposed that publication of our proceedings in Gastroenterology be discontinued. Instead, the proceedings of the scientific session will be published in toto, including the full manuscript instead of an abstract, in the Bulletin of the American Gastroscopic Society. In addition, all candidates for admission will henceforth be required to submit a suitable article, or an especially well worked-up and documented case report, that may be published in the Bulletin. This requirement is intended to increase still further the material available for publication. To provide the time and interest for the preparation of such an article or case report, the admission requirement of 50 protocols is being abolished.

It is hoped that four issues of the Bulletin will henceforth be regularly published. This, together with the improved content, should procure official acceptance and indexing. All this should encourage freer use on the part of advertisers and this in turn will help to defray publishing expenses.

The Bulletin is something in which all of us can take considerable pride. The better it is made, the prouder we may become. The devotion of our Editor, Dr. Roy Sexton, and of our Editorial Board and its Chairman, Dr. John Tilden Howard, deserve particular note. Their efforts well merit our thanks and appreciation.

Plans are now being made for the Annual Meeting in 1960. This will be held in conjunction with the American Gastroenterological Association and the Postgraduate Course in Gastroenterology that will be given in April, 1960 in New Orleans.

A committee consisting of Drs. C. Wilmer Wirts and Arthur M. Olsen are busily at work preparing a wholesale revision of our Constitution and By-Laws. Another committee is busily considering the problem of establishing standards of qualifi-

cation for the performance of endoscopic procedures. Some definition along these lines and some uniformity of application throughout the country appear to many to be desirable.

I cannot close without paying tribute to the officers, the members of the Governing Board, and the members of the various committees. The effort and time they expend on behalf of our Society are beyond description.

See you at the meeting in June.

J. Edward Berk, M.D.

Notes from the Secretary

It has been a pleasure to serve as the Secretary-Treasurer of the American Gastroscopic Society during the past year. I have enjoyed my associations with many members of the Society and particularly with the members of the Governing Board. As all of you know, this Board is composed of the present officers and the past four Presidents of the Society. In addition, the Chairman of Admissions Committee, Dr. Paul Shallenberger, and the Editor of the Bulletin, Dr. Roy Sexton, are ex-officio members of the Board. I wish to express my appreciation to all of these men for the help they have given me during the past year.

I am sure that all of you have read "The President's Page." Dr. Berk has reviewed the more important matters which concern our Society. At the meeting of the Governing Board in November there were certain other matters which should be of interest to all members of the Society. At the time of this meeting there were 196 active members in the American Gastroscopic Society and, in addition, there were two senior members. The following men were accepted into membership at the Board meeting: Dr. David Katz, 175 Crary Avenue, Mount Vernon, New York; Dr. Allan A. Kaplan, 407 Lincoln Road, Miami Beach, Florida; Dr. Harold Koretz, Veterans' Administration Hospital, Bath, New York; Dr. Jacob Lichstein, 6360 Wilshire Boulevard, Los Angeles, California; Dr. Martin Liemer, 963 Park Avenue, Plainfield, New Jersey; Dr. Gaston R. VanTrappen, 44 Wijnstraat, Ronse, Belgium. This brings the total membership to 204. Application blanks have been sent to twelve individuals who have expressed interest in joining the American Gastroscopic Society. Some of these applications are complete and will be ready for action by the Admissions Committee before the annual meeting. We are certainly pleased to have a fine group of new applicants for the Society.

Much of the meeting of the Governing Board was devoted to a discussion of the Bulletin, and Dr. Berk has already made considerable reference to this. I am sure that all of you were greatly impressed by the issues of the Bulletin that have appeared in the past year. I am sure that we should continue this outstanding journal, and I certainly hope that it will be possible to publish it regularly on a quarterly basis. As Dr. Berk indicated in his President's Page, the entire proceedings of the annual meetings will henceforth be published in the Bulletin. Also, case reports and papers submitted by new applicants will be available for publication, and we should have no difficulty in obtaining adequate material for our journal.

The President appointed a committee consisting of Dr. Shallenberger and the Secretary to revise the application forms and instruction sheets for new members. Considerable progress has been made on this matter and it is hoped to have new sample forms for your approval at the annual meeting. Likewise, progress is being made on the revision of the Constitution and By-Laws.

I should like to report that the Society is solvent and that most of the members have already paid their annual dues. I am grateful for the cooperation of everyone in this regard. I shall look forward to seeing all of you at Haddon Hall on June 7.

A. M. Olsen, M.D.

For Biopsy and Aspiration

Benedict FLEXIBLE Operating Gastroscope

To meet the long-felt need for gastric biopsies in the diagnosis of lymphoma, carcinoma and gastritis, A.C.M.I. (in cooperation with Dr. Edward B. Benedict) has devised an instrument that offers a successful means for aspirating secretions and obtaining biopsies. Similar to the A.C.M.I. flexible examining gastroscope in its illumination and optics, this new instrument has an additional channel through which a plastic aspirating tube or biopsy forceps may be introduced. Both the tube and the forceps are brought into exact position by means of an "elevator" controlled from the proximal end of the instrument.

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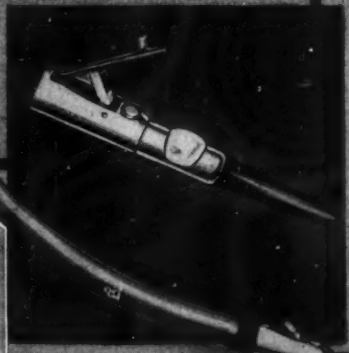

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Program

EIGHTEENTH ANNUAL MEETING

American Gastroscopic Society

Sunday, June 7, 1959

Haddon Hall, Atlantic City, New Jersey

EASTERN DAYLIGHT SAVING TIME

MORNING

8:00 A.M. Registration

9:00 A.M. Symposium on Gastroscopic Color Photography
Moderator—Frank B. McGlone, Denver, Colorado

Presentation of Instruments, Techniques and Results
1. Ivan C. Keever and Clifford J. Barborka, Chicago, Illinois
2. Harry Segal, Rochester, New York
3. Robert S. Nelson, Houston, Texas

Presentation of Selected Cases with Gastroscopic Color Photos
Frank B. McGlone

Interpretations of Photographs by Panel
Cecil O. Patterson, Dallas, Texas
John M. Rumball, U.S.V.A., Washington, D. C.
Ben H. Sullivan, Jr., Col.M.C., U.S.A.

Interpretation of Photographs by Others

Summary
Frank B. McGlone

10:30-10:45 A.M. Intermission

10:45 A.M. Symposium on Endoscopic Biopsy of the Stomach
Moderator—C. Wilmer Wirts, Philadelphia, Pennsylvania

Presentation of Instruments, Techniques and Results
1. Biopsy by Blind Suction Technique
Cyrus E. Rubin, Seattle, Washington
2. Biopsy with the Benedict Operating Gastroscope
Paul L. Shallenberger, Sayre, Pennsylvania
3. Biopsy with the Benedict Instrument and Comments Concerning Gastric Scrapings
Emmanuel Deutsch, Boston, Massachusetts
4. Biopsy with a Suction Biopsy Attachment
John Tomenius, Djursholm, Sweden
5. Interpretation of Projected Photo of Biopsy by Pathologists
Howard J. Christian, M.D., Dorchester, Massachusetts,
Robert L. Breckenridge, M.D., Philadelphia, Pennsylvania

Presentation of Collected Opinions of Examining Pathologists

Summary
C. Wilmer Wirts

12:15 P.M. Intermission for Lunch

AFTERNOON

1:30 P.M. Symposium on Instruments and Techniques for Esophagoscopy
Moderator—Herman J. Moersch, Rochester, Minnesota

Presentation of Instruments

1. The Rigid Esophagoscope and Conventional Technique
   Edward B. Benedict, Boston, Massachusetts
2. The Rigid Esophagoscope with the Flexible Obturator
   John Tilden Howard, Baltimore, Maryland
3. The Schindler Esophagoscope
   Angelo E. Dagradi, Garden Grove, California
4. A Flexible Tube Esophagoscope
   Edwin Boros, New York, New York
5. The Eder-Hufford Esophagoscope
   A. Ray Hufford, Grand Rapids, Michigan

Critical Evaluation
Open Discussion From Floor

Summary
Herman J. Moersch

2:30- 2:45 P.M. Intermission

2:45 P.M. Formal Presentations

1. Gastroscopic Examination of the Terminal Esophagus and Esophagocardiac Junction
   Stephen J. Stempien, Angelo Dagradi, U.S.V.A., Long Beach, California
2. Management of Gastric Polyps
   Robert J. Priest, Travis Bridwell, Detroit, Michigan
3. Clinical Manifestations of Extensive Atrophy of the Gastric Mucosa (Advanced Atrophic Gastritis)
   Angelo B. Dagradi, Rachel K. Goth, Stephen J. Stempien, U.S.V.A., Long Beach, California
4. Gastroscopic and Clinical Evaluation of Postgastrectomy Patients
   J. Alfred Rider, San Francisco, California

BUSINESS MEETING

3:45 P.M. For Active Members Only

SOCIAL PROGRAM

6:30 P.M. Cocktails

7:30 P.M. Annual Banquet
Presiding—J. Edward Berk, President, American Gastroscopic Society
Presentation of Rudolph Schindler Award
Speaker: Captain Finn Ronne, military commander and scientific leader of Ellsworth Station during the International Geophysical Year. Son of Martin Ronne, who accompanied Amundsen to the South Pole in 1911, and recipient of two Congressional Medals for his work in polar exploration, Captain Ronne will speak on "Exploring Antarctica."

CASE REPORT

A Patient With Multiple Gastric Polyps Observed Over a Ten Year Period

By MARK W. GARRY, M.D.*

E.A.V., a 70 year old white male, was admitted to the hospital on June 13, 1958, in congestive heart failure with a history of several recent brief episodes of weakness and perspiration without pain or dyspnea. Since his first hospitalization in 1948 he has carried the diagnosis of arteriosclerotic heart disease, hypertensive heart disease, arteriolar nephrosclerosis, chronic cholecystitis with cholelithiasis, multiple gastric polyps and secondary anemia due to undetermined cause. There have been repeated admissions for congestive heart failure and blood transfusions were required during the hospital course on three different occasions. System review elicited a history of nocturia, frequency and hesitancy of the urinary stream.

Physical examination: The patient was a well developed, well nourished, white male, congenial, alert, cooperative and in no distress. The heart was enlarged; the rate was regular at 84 a minute; there was no murmur or friction rub; the tones were rather distant, ascribable to an emphysematous chest. The blood pressure was 189/110. The prostate was slightly enlarged and hard, but was smooth and non-tender. The skin presented a generalized, scattered, brownish pigmented thickening which proved to be melanosis cutis.

Laboratory: The white blood count was 5,000 with a normal differential. The hemoglobin was 9 grams. Urinalyses revealed a two to four plus albuminuria. An Addis count showed an abundance of casts, red and white cells, while routine urinalyses invariably revealed a few white cells, without red cells. The serological tests for syphilis were negative. Twenty-seven per cent of PSP was excreted within 15 minutes. The NPN ranged from 45 to 100 mgs. per cent, usually in the region of 80 mgs. per cent. Indices revealed hypochromic microcytic anemia, and total serum iron measured 10 gamma per cent with serum iron combining capacity of 317 gamma per cent. The serum electrolytes were initially normal, but later revealed changes of hyperkalemia, and later of hyponatremia and of hyperchloremia.

Electrocardiogram was interpreted as sinus bradycardia, with complete left bundle branch block. Bone marrow was normal, other than for reduced iron content.

Chest x-rays on his last admission showed a heart that was markedly enlarged, with the transverse diameter measuring 18.8 cms. In the lungs there were scattered fibrotic changes in both hilar and midlung areas. Subsequent films were compatible with pneumonitis on both sides. On upper G.I. series taken during the first hospitalization in 1948, a gastric polyp was detected in the proximal one-third of the stomach on the greater curvature posteriorly. Barium enema revealed several small diverticula in the sigmoid colon.

Gastroscopy, January 28, 1949: The instrument was introduced to depth 1. A normally functioning, normal appearing pylorus was visualized. On the greater curvature in the mid-antral region was a small round nodule attached to the mucosa by a short, broad-based stalk. The antral mucosa and that covering the nodule appeared normal. At depth 2, in the pars media, there was a patch of dull, grey, thin mucosa in which could be seen vascular arborization. Retraction of the instrument to depth 3 revealed a broad-based nodular polyp, measuring approximately 3 x 3 cms., on the greater curvature posteriorly. The overlying mucosa appeared grey-white with streaks of fresh blood on the surface. In addition to the impression of atrophic mucosal change, the diagnosis of multiple polyps, questionably benign, was made.

Subsequent course: Surgical removal of the polyps and examination for malignancy was advised but refused by the patient. He re-entered the hospital in February, 1952, with broncho-pneumonia and during his hospital stay his gastrointestinal status was re-evaluated. Gastroscopic and roentgenologic studies showed no change. In August, 1954, patient returned to the hospital with complaint of epigastric pain of four weeks duration. Repeat gastroscopy and G.I. x-ray revealed no change in size or appearance of gastric

* *Associate Professor of Medicine, Marquette University School of Medicine, and Chief, Medical Service, Veterans Administration Hospital (Wood), Milwaukee, Wisconsin.*

polyps. While in the hospital the patient developed mild cardiac decompensation on the basis of hypertensive and arteriosclerotic heart disease; this responded promptly to therapy. Patient was rehospitalized in 1956, 1957 and April, 1958, for recurring cardiac decompensation. His last admission occurred on June 13, 1958, when he was again in congestive failure which cleared rapidly with definitive treatment. Upper G.I. series was unchanged. Gastroscopy was requested and done on July 1, 1958, and the appearance of the polyps was essentially unchanged.

Course in the hospital: The patient was afebrile. His lungs cleared readily with the use of a low sodium diet, continued digoxin, and the use of Diuril. Recurrent pulmonary infarction was considered possible in view of his recent clinical episodes, together with chronic cardiac decompensation and x-ray evidence of changing pulmonary shadows. Anti-coagulation with Coumadin for eleven days did not result in appreciably increased melena (stools were uniformly positive for occult blood, however). Episodes similar to those prior to admission did not recur in the hospital, and he had become quite well by July 1, 1958. Shortly thereafter occurred the first of a series of complications consisting of digitalis intoxication, increased gastrointestinal bleeding requiring overall a total of seventeen units of whole blood, pneumonitis, potassium intoxication, hyperchloremic acidosis, atrial fibrillation, recurrence of pneumonia and, eventually, thrombosis of the left internal carotid artery. This last resulted in his permanent confinement to bed thereafter and his condition gradually deteriorated. He expired at 7:05 a.m. on September 12, 1958. Autopsy was refused.

DIAGNOSES:

1. Pneumonia, bilateral, recurrent.
2. Chronic bronchitis.
3. Pulmonary emphysema.
4. Hypertensive and Arteriosclerotic cardiovascular disease.
5. Chronic pyelonephritis.
6. Benign prostatic hypertrophy.
7. Polyps of the stomach, benign.
8. Atrophic gastritis, moderate.
9. Chronic cholecystitis, with cholelithiasis.
10. Melanosis cutis, generalized.
11. Thrombosis of left internal carotid artery, with right hemiplegia.

COMMENTS:

This case is illustrative of several interesting facets of the gastroscopic procedure: It complements and supplements the roentgenologic gastrointestinal survey; in this instance the presence of more than one polyp was revealed by the procedure. It adds life and color and substance to the profile of the x-ray, thereby exposing the character of the observed alterations. It readily lends itself to sequential studies of gastric mucosal changes which will demonstrate the stability or relative instability of the lesion. This patient's course, as related to his gastric polyps, remained unchanged over a period of approximately ten years during which he had numerous roentgenologic and gastroscopic examinations. The original doubt as to the benign character of the polyps seems to have been fairly dispelled by repeated observations. On only one occasion was the major complaint related to his stomach, so it may be inferred that these benign lesions played a very minor role in the physical distress that marked the last decade of the patient's life and in all probability contributed nothing to his death. We were, unfortunately, unable to obtain an autopsy for final substantiation of our clinical impression.

DISCUSSION:

Schindler and McGlone [1] have classified gastric polyps as (1) inflammatory pseudopolyps which originate as compensatory formations in the presence of chronic atrophich gastritis, (2) true adenomatous polyps, and (3) hyperplastic polyps. Of these forms the true adenomatous polyp occurs with greatest frequency and is generally benign. In Carey and Hays' [2] account atrophic gastritis was an associated finding in 46 of the 66 patients. They described these benign tumors as "small, flat-based domes, like split peas or small tits or mushroom-like stalks", and it was their impression that "the gastroscopic appearance has given the most consistently accurate evidence of the (benign or malignant) nature of gastric polyps". Eddy Palmer [3] is of the opinion, however, that gastroscopy cannot be relied upon to differentiate between benignancy and malignancy at a stage consistent with the surgical removal of a polyp undergoing early malignant change. Many authors recommend the removal of all benign tumors of the stomach whether they are causing symptoms or not. But there is a growing attraction toward a

more conservative handling of these cases. Spriggs and Marxer,[4] Rigler and Erickson[5] are among those who have observed patients over a period of several years with no evidence of change in the appearance of the tumors. Paul and Logan[6] have pointed out that it is a fact that in all cases in the literature in which single or multiple polyps were diagnosed, the cause of death for the majority of the patients was some other disease. Tumor size has been suggested by Rieniets and Broders[7] as a criterion of some value in estimating whether the polyp is malignant; they found that every tumor in their series with a diameter greater than 2.3 cms. had undergone malignant change. In the case which I have cited one of the polyps was approximately 3 cms. in diameter and no external alteration was observed over the ten year period. This could be the exception, but I have followed six other patients with multiple gastric polyps ranging in size from 0.5 to 3.5 cms. in diameter for the past five years and these, too, have remainded unchanged. In each case, surgical removal was not possible because of some physical impediment or the reluctance of the patient. Fortunately or not, the clinical manifestations, if any, are relatively mild and add nothing to the burden of living. The patients generally are content to submit to the regular repeated observations of their lesions and so provide an opportunity for prolonged study and evaluation of a still controversial type lesion.

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Obituary

Dr. Stockton Kimball, Dean of the University of Buffalo Medical School, died in Buffalo on February 7, 1958, after a brief illness. A grandson of Dr. Charles G. Stockton, who was a founder and the first President of the American Gastroenterological Association in 1897, Dr. Kimball maintained a long and active interest in the field of gastroenterology both as an investigator and a practitioner until the responsibilities of medical education engaged the greater part of his time and effort.

Dr. Kimball studied extensively in Europe at Guy's Hospital and in Freiburg, Germany, under Dr. Ludwig Aschoff. His primary interest at this time was the development of tests of liver function. Together with Dr. Allan Jones, Dr. Kimball prepared a notable monograph on peptic ulcer, as well as making other contributions to the scientific literature. He was one of the first gastroenterologists in his community to employ gastroscopy as a diagnostic measure. Until his chairing as Dean some ten years ago, Dr. Kimball was widely respected as a gastroenterologic consultant and gastroscopist.

On his passing Dr. Clifford C. Furnas, Chancellor of the University of Buffalo, declared that the loss of Dean Kimball "is a cause for sorrow in the whole Buffalo community and the world of medicine which he has served in a most outstanding manner for more than twenty-five years. He was truly a great man, whose memory will always be most highly revered by his multitude of friends and colleagues."

WILLIAM F. LIPP, M.D.

FOREIGN LETTERS

Report From Three European Meetings

The number of professional conferences going on continually throughout Western Germany these days is truly astounding. One can hardly visit a city of any size without being sure that some sort of society meeting, state symposium, annual lecture series, or memorial conference will be going on at the time. This is quite a change from the situation of 10 years ago, when German medicine seemed to the outsider to be characterized by a notably introversive attitude. The great postgraduate educational expansion is also apparent in German medical publication, especially of books—recent figures showing exportation of medical books are very impressive.

Wurzburg today is primarily a university town. A university that is approaching its 400th year and has produced W. K. Roentgen to boot might be content to rest for awhile, but it is found to be an energetic, going outfit. At a recent conference on clinical laboratory technics a great many supertechnical biochemical matters were discussed. The thing that appealed most to the clinical gastroenterologist (this one understood very little of the rest) was further discussion of a very simple but important matter, gastric study with the help of "Desmoidpillen." This is the German answer to the complicated and costly laboratory procedure necessary for completing "tubeless gastric analysis" by the exchange resin method. It gives the same information regarding the presence of free acid as the latter technic, has the same screening usefulness, and, as best I can tell from fairly extensive trial, has about the same degree of sensitivity. The patient merely swallows a tiny pill of methylene blue which is tied up with catgut in a bit of rubber sheeting, like a little sack. If there is free acid, the gut quickly dissolves away, the methylene blue is freed, and the patient's urine turns blue. If there is no free acid, the pill passes unmolested. It works! The total cost per test is about a penny.

The University of the Saar is in Homburg, which is really a distant suburb of Saarbrucken. For the gastroenterologist, the most interesting work being done here comes from the anatomist, Prof. Ernst Rolhoven. Prof. Rolhoven has found out more about the functional anatomy of the portal venous system than has anyone else. At a recent meeting in Landstuhl, he presented a summary of his findings. His most important contribution has been to demonstrate that the portal system potentially has a high degree of control over its own velocity flow. This, he has found, operates through intrinsic sphincter activity of the venous circular muscle, mainly in the distal portal vein. Such information has, of course, great significance for the understanding of esophageal varix behavior.

The Polish Labor Battalions, as expected, include many talented physicians, especially throughout France. It is quite difficult to establish professional relationships with these men, although a few are available as postgraduate trainees at our Army hospitals in both Germany and France. Dr. W. M. Krzyzewski, medical officer for the Polish Labor Battalion at Orleans, recently discussed the psychodynamics of achalasia at a conference in La Chapelle. He made two arguments for and two against the advisability of thinking of achalasia as a psychosomatic disease. First, the disease often seems to begin immediately following a major emotional upset, and, second, established achalasia rather often becomes worse during periods of stress. On the other hand, a morphologically and, presumably, etiologically identical disease is encountered in infants. His final point was an interesting one: almost all recognized psychosomatic diseases tend to cause symptoms before or very soon after the first pathologic change, but with achalasia it is not unusual to find that huge chronic dilatation of the esophagus has already developed by the time the patient first begins to have symptoms.

EDDY D. PALMER, Lt. Col., M.C., U.S.A.

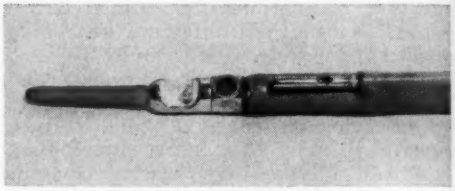
ARTICLES

Combined Gastroscopy and Direct Vision Biopsy—Method and Application

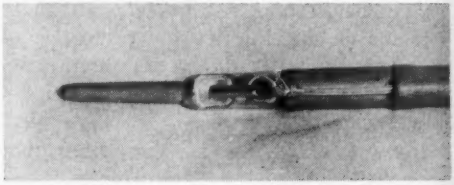
P. E. Thompson Hancock, M.D.*

Two years ago I had the honor of speaking to you at your meeting in Chicago and I would like to thank you again for giving me this opportunity. I was then reviewing the gastroscopic work which had been done in England. In conclusion, I told you that Dr. Margot Shiner, who is working at the Department of Gastroenterology, Central Middlesex Hospital in London, had been taking many blind gastric, duodenal and jejunal biopsies and was trying to incorporate a suction biopsy tube with the Hermon Taylor gastroscope. Since that time she and I have been working on this project and the Genito-Urinary Manufacturing Company of London has now produced to our satisfaction an instrument which we should like briefly to present to you.

This instrument incorporates the Hermon Taylor gastroscope. It has controlled flexibility of its distal third and a suction biopsy device which allows excellent biopsy specimens to be obtained and which can usually be applied accurately at the point from which a biopsy is required. The instrument is shown in Figs. 1 to 3. In Fig. 1 the whole instrument is shown. The suction biopsy tube lies on the outer side of the rigid portion to which it is attached by rubber bands and runs down in a special extra channel in the outer sheath of the flexible portion. The suction biopsy tube incorporates in its wall a mild-tempered spiral wire which allows it to be sprung towards the side on which the biopsy aperture is situated. The biopsy tube may be slid down from its resting position into its action station opposite the objective lens and its correct position can then be determined by a mark on the back of the biopsy head which can be clearly seen. For purposes of introduction or withdrawal the biopsy tube is rotated through 180° so that the aperture faces the wall of the gastroscope and the tube is then sprung towards the gastroscope holding it firmly against it.



In Fig. 2 the biopsy tube is shown in its resting position but it has already been rotated so that the aperture is facing forward ready for use.



In Fig. 3 the biopsy tube has been pushed down to its correct position opposite the objective lens.

By suitable use of the controlled flexibility of the gastroscope and the fact that the biopsy head is sprung away from the gastroscope so that when it is opposite the objective lens it is about 1 cm. in front of it, it can usually be applied accurately to the point from which a biopsy is desired. From practical experience one finds that sometimes most of the air which has been put into the stomach to allow good visibility has to be exhausted before the biopsy aperture can be applied to the desired part of the gastric mucosa, in which case there may be some limitation of visibility. Usually, however, the lesion can still be seen when the biopsy head is applied to it. In Fig. 2 the guillotine knife can be seen through the biopsy aperture.

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There are already a number of different operating gastroscopes designed for the purpose of taking biopsies. Any new instrument should have some particular advantages over those already in use. We believe that this gastroscope fulfills these requirements, which are

1. Good biopsy specimens, unfragmented and adequate for histological purposes.
2. Ability to take the biopsy from the chosen site.
3. Ease of introduction of the instrument so that the biopsy gastroscope may be used for routine gastroscopies.
4. That the patient should suffer little, if any, increased discomfort as compared to a normal gastroscopy.
5. That the procedure be safe.

This biopsy gastroscope has only been available in its final form for a few months but I have personally passed it on 65 patients presenting consecutively for gastroscopy at the Royal Marsden Hospital, London. I have experienced no special difficulties of introduction nor have any complications arisen. I have kept a careful record of the amount of discomfort that is experienced by all patients whom I have gastroscoped and I judge the discomfort in this small series to be about equal to that experienced when I have passed the ordinary Hermon Taylor gastroscope, which I have done on over 2,500 occasions. I am proposing to continue using the combined biopsy gastroscope for routine gastroscopies and I am now asking Dr. Shiner to tell you about the specimens we have obtained and from how many cases we have failed to obtain satisfactory biopsy specimens.

SUMMARY

1. A new biopsy gastroscope is described incorporating a suction biopsy device with the Hermon Taylor gastroscope.
2. Criteria are listed which a new biopsy gastroscope should satisfy and it is claimed that this gastroscope does fulfill these conditions.

Combined Gastroscopy and Direct Vision Biopsy: Histological Findings

MARGOT SHINER, M.D.*

The combined instrument was used on 80 patients without a single complication. Biopsy was attempted on 71 patients and specimens were obtained from 64. The specimens taken earlier in the trials proved rather fragmented and inadequate from our point of view, as we aimed at obtaining full thickness mucosal specimens. By changing the biopsy aperture from a round shape to an oval one, measuring 3.5 by 2.5mm., we obtained less fragmented specimens including, in the majority, muscularis mucosae. Discarding any specimens inadequate for histological interpretation because of fragmentation or lack of mucosal depth, 48 specimens remained suitable for detailed analysis.

Between one and three mucosal specimens were taken from each patient. Thirty-eight contained full thickness mucosa including muscularis mucosae, 10 contained only the full depth of mucosa without muscularis mucosae. Compared to blind gastric biopsy specimens taken with the Wood gastric biopsy tube, those obtained with the combined instrument appeared a little more fragmented and this is most likely due to the smaller size of the biopsy attachment.

Most of the gastroscopic biopsies were taken consecutively from patients presenting themselves for gastroscopy, although 11 were selectively performed.

We examined the specimens in relation to the following points of interest:

1. The nature of the gastric lesion, whether ulcer, neoplasm or other gastric infiltration as seen on gastroscopy, and its confirmation by biopsy.
2. The description by the gastroscopist of the appearances of the gastric mucosa and histological confirmation or otherwise of the gastroscopist's impressions.
3. The correlation of barium meal, gastroscopy and histology.
4. Biopsies of the stomach from any two points within a certain distance of each other and histological similarities or dissimilarities.
5. Biopsy at the stoma in patients who

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had undergone partial gastrectomy.

6. Comparison of gastric specimens taken by the blind biopsy method from patients with gastric ulcers and those taken by direct vision from near the site of the ulcer.

Gastric Ulcers, Neoplasms or Other Infiltrations

A gastric ulcer was seen gastroscopically in 12 patients, and thought to be benign in 11 of these. This was confirmed by biopsy taken from the edge of the ulcer. The 12th patient showed gross thickening of the mucosa in a small area in the fundal region with irregular ulceration, suggestive of carcinoma of the stomach. Histologically, there were normal arrangements of the mucosal glands but some irregularity of the glandular nuclei. This patient is awaiting laparotomy.

Carcinoma of the stomach was suspected gastroscopically in two patients but confirmed histologically in only one.

In one patient gastroscopic appearances were suggestive of leukemic infiltration but biopsy from such an area was unable to confirm this.

Macrosropic and Microscopic Correlation

Agreement between gastroscopic and histological appearances were observed in 5 patients in whom the general mucosal picture was described, and disagreement in 6 patients. It was found that gastroscopic descriptions such as "hypertrophic mucosa" or "areas of mammillation" had no histological meaning, but where gastric atrophy was described it was confirmed histologically.

Correlation of Barium Meal, Gastroscopy and Histology

In two patients mucosal biopsy under direct vision showed carcinoma of the stomach where previous barium meals were negative. The first patient, D.F., gave a history of dyspepsia of short duration though his symptoms were persistent throughout. X-ray of the stomach was normal. Gastroscopic appearances were those of actue superficial gastritis, particularly obvious on the anterior wall of the stomach towards the greater curvature. Biopsy was taken from this region and histological examination showed a mucin-secreting adenocarcinoma. At operation the superficial mucosa appeared patchily irregular, but no definite lesion could be identified and the glands were not involved. Partial gastrectomy was carried out and the resected portion of the stomach was subjected to histological examination, revealing a diffuse adenocarcinoma confined to the mucosal layer only; it also involved the line of resection. Subsequently total gastrectomy was carried out. The patient is alive and well after 2 years.

The second patient, V.H., complained of dyspepsia without weight loss for only 6 weeks. Barium meal was negative. Gastroscopy revealed irregularity and rigidity over an area occupying 2 to 3 inches in the region of the cardiac part of the stomach. Carcinoma was suspected and direct vision biopsy over this area was taken. Histology showed an infiltrating anaplastic type of carcinoma invading the lymphatics. The subsequently resected part of the stomach showed a non-ulcerating squamous cell carcinoma of the esophagus invading the adjacent portion of the stomach.

Biopsies of the Stomach from Any Two Points

In 8 patients biopsies under direct vision were taken from 2 separate regions of the stomach. Only one patient showed a gastroscopically abnormal appearance in the form of a constriction but biopsies taken above and below this constriction revealed no abnormalities. In the remaining 7 patients in whom gastroscopic lesions could not be demonstrated there was agreement between 2 biopsy specimens in 3, and disagreement in 4. In 2 patients biopsies taken from two different areas on the lesser curvature showed histopathological dissimilarities in each case.

Biopsy at the Partial Gastrectomy Stoma

In 7 patients with a Polya type partial gastrectomy biopsies in the region of the stoma on the gastric side showed, on histology, small intestinal type of mucosa. We think the explanation of this lies in the extension of this type of tissue into the stomach around the anastomotic stoma. Similar extension of small intestinal mucosa into the stomach has been observed in studies of the pyloroduodenal junction in normal people. In 2 of the 4 patients this extension was associated with the presence of stomal ulcers. This raises the question of whether the small intestinal mucosa is particularly susceptible to ulcer

formation in the presence of free acid in the gastric juice.

Comparison of Direct Vision and Blind Gastric Biopsies

Twelve of the 48 patients in whom biopsies were taken under direct vision suffered from gastric ulcers seen on gastroscopy. In 3 further patients a healed ulcer was noted. Biopsy at the site of the healed or active ulcers in these patients showed normal mucosa in one-third of them, gastritis without atrophy in another one-third and partial atrophic gastritis or gastric atrophy in a further one-third. These figures may be compared with those of 9 patients with gastric ulcers reported by Shiner and Doniach, in whom by the blind method one-third showed normal mucosa and two-thirds showed gastritis without atrophy. But on examining another 10 blind biopsy specimens from gastric ulcer patients and also comparing repeat biopsies in these patients, gastric atrophy was found to occur in one-half of the patients and repeat biopsies from any single patient showed disagreement between first and second biopsy specimens.

Conclusion

We believe gastric biopsy under direct vision to be a necessary adjunct to efficient gastroscopy, not only because of identification of a possible neoplastic lesion, but also to confirm or deny the overall macroscopic appearance of the gastric mucosa as seen by the gastroscopist.

Our study of the gastric mucosa from point to point and also comparison with blind gastric biopsy leads us to the conclusion that there is no uniform histopathological picture throughout the mucosa in any one stomach except perhaps in gastric atrophy.

The occasional histological identification of a neoplastic lesion in a gastroscopically unsuspected or doubtful area, justifies the routine use of the combined gastroscopy-biopsy instrument.

The value of obtaining a mucosal specimen containing the full depth of mucosa is as great as that of obtaining an actual biopsy of the stomach.

Gastric Ulcer As Seen In Australia

John Horan, M.D.*

It is proposed to deal with this subject in the restricted sense and to consider "Gastric Ulcer in Australia" only as it is seen through the gastroscope. In 1937 the writer learned from Schindler a technique in gastroscopy which he has since applied in Melbourne. This paper describes the findings in 120 cases of gastric ulcer in a series of 1200 consecutive gastroscopic examinations made on patients, the majority of whom were out-patients.

The Wolf-Schindler gastroscope with 85° angle of vision was used almost exclusively. On rare occasions the Hermon Taylor gastroscope was used. This instrument, although it has a flexible end, has the disadvantage, when fully introduced, of a completely rigid instrument in that it does not conform to the angle made by the posterior wall of the stomach with the esophagus. It cannot be overemphasized that the longitudinal axis of the stomach lies in an oblique position running from behind forwards and thus forming a distinct angle with the esophagus.

Site of Gastric Ulcer

Moutier [1] has pointed out that the upper level at which gastric ulcers are seen with a gastroscope is 4 or 5 cm. below the cardia. He states that, at this level of the stomach, ulcers are situated on the lesser curvature and the adjacent part of the posterior wall. He points out that, farther down in the stomach, the ulcer-bearing area tends to move from the posterior wall, crosses the lesser curvature at the level of the angulus and appears on the anterior wall of the stomach; thus it follows an oblique line from above downwards and from behind forwards. Such a distribution was found in the present series, 31 ulcers being situated in the upper third of the stomach and 14 of them on the posterior wall. In the middle of the stomach the ulcer-bearing area was more anterior, on the lesser curvature mainly above and at the angulus, there being 50 in this situation. Below this the ulcers decreased in numbers and fanned out over the anterior wall of the stomach and into the pyloric antrum. It is of interest to note that only 13 ulcers in this series were seen in the antrum and

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on only one occasion was an ulcer seen on the edge of the pylorus (fig. 1).

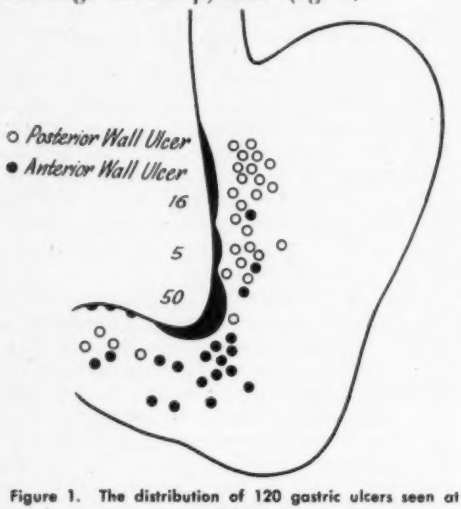
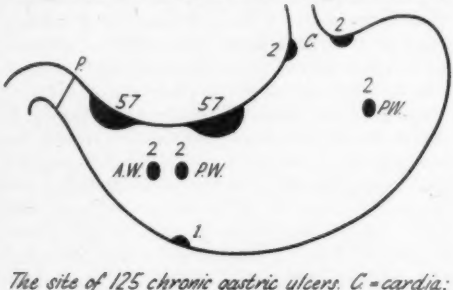


Figure 1. The distribution of 120 gastric ulcers seen at gastroscopy.

These findings are different from the findings of the pathologist, who at post-mortem shows that ulcers are not infrequent in the antrum. In a series of 4085 consecutive autopsies performed at the Royal Melbourne Hospital during the ten year period 1927 to 1936, the late R. Wright-Smith [2] found chronic gastric ulcer-



The site of 125 chronic gastric ulcers. C.=cardia; P.=pylorus; A.W.=anterior wall; P.W.=posterior wall.

Figure 2. The situation at autopsy of 125 chronic gastric ulcers according to R. Wright-Smith (By courtesy M. J. Australia)

ation in 125 cases. Figure 2 shows the distribution of these ulcers. The diagram gives the impression that about half are in the pyloric antrum and that the majority of the remainder are on the lesser curvature above the incisura angularis. These figures correspond closely to those of Portis and Jaffe [3] in Chicago who studied autopsy material and found that of 196 gastric ulcers 59% occurred in the distal 6 cm. of the stomach. Bockus [4] has pointed out that, in the stomach after death, 6 cm. is a liberal allowance for the lesser curvature measurement of the pyloric canal and antrum and that, although it is possible that many of the ulcers recorded by Portis and Jaffe were, in the living patient, at the incisura or just proximal to it, their figures do indicate a greater incidence of ulcer in the pyloric segment than the clinician finds. Bockus thinks that either many of the pyloric ulcers do not cause symptoms or, what is more likely, symptoms have been present but, since X-ray shows only pyloric irritability, a diagnosis of organic disease is not made. He also thinks that many of the ulcers are small and heal rapidly. Keller,[5] too, has pointed out that the ulcers of the antrum are usually situated on its lesser curve and that they do not penetrate deeply; because they are in the roof of the antrum and are shallow it is difficult to show them filled with barium.

In direct contrast to Moutier's series in which "true ulcer" was not present in the antrum, 13 cases of benign ulcer of the pyloric antrum were seen in the present series. Although these ulcers were unquestionably innocent, an ulcer in the antrum is always under suspicion of malignancy and the writer regards a chronic ulcer in this situation, but not on the pyloric ring, as being a clear indication for gastrectomy.

Besides such differences of ulceration there are other features which distinguish the cavity of the antrum from the body of the stomach. Firstly, an observation, recorded by Cleland,[6] is that the pyloric antrum in the newborn infant is a very definite anatomical structure, clearly defined both externally and internally from the fundus above and the duodenum below and in longitudinal section appearing as a cartilaginous-looking layer which gradually becomes narrower proximally (fig. 3).

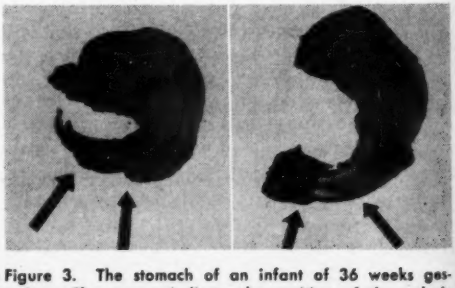


Figure 3. The stomach of an infant of 36 weeks gestation. The arrows indicate the position of the pyloric antrum. A. Stomach viewed from the front. B. Stomach opened longitudinally and viewed from the front. (Specimens by courtesy of Professor J. B. Cleland)

This would suggest that the antrum and the body are distinct entities developmentally. Secondly, Schindler [7] has suggested that the musculus sphincter antri, together with the angulus, divides the stomach into two distinct cavities, namely the corpus and the antrum. This is supported by the fact that the antrum contains the pyloric glands and that these extend on the lesser curvature exactly to the angulus. On the greater curvature there is some uncertainty as to how high they extend. Paschkis and Orator [8] say that they are found in a small segment close to the pylorus and Plenk [9] that they extend from the pylorus to the "knee" of the stomach, the "knee" being the lowest part of the stomach in the upright position. Thirdly, during gastroscopy peristalsis is peculiar to the antrum and always begins just distal to the musculus sphincter antri.

The writer is of the opinion that spasm of the antrum plays a major part in determining the position of the chronic gastric ulcer on the lesser curvature of the stomach at, or just above, the incisura angularis. In the patient with gastric ulcer the writer has often been impressed by the resistance of the antrum to opening up with air and, when opened, by its obviously increased muscle tone; this was associated with a general irritability of the stomach. The most difficult gastroscopic examination to make is one in patients with symptoms recurring after gastrectomy or gastroenterostomy. It is made difficult by the irritability of the patient's stomach, which is intolerant of even small quantities of air introduced during the examination; contractions are frequent and belching may occur. Next most difficult is the gastroscopic examination made on a patient with a duodenal ulcer; and only a little less difficult, because of spasm, is that in gastric ulcer. In all these conditions the spasm of the stomach wall can be appreciated by the increased resistance offered to the introduction of air; and the antrum takes part in this irritability of the stomach.

By means of radiology Gutmann [10] has demonstrated spasm of the antrum occurring with gastric ulcer. He refers to "the frequent changes of the pyloric antrum resulting from an ulcer of the lesser curvature situated either on the lesser curvature of the antrum itself or more often higher up, at the level of the incisura, on the vertical part of the lesser curvature or just below the cardia." He considers that these appearances are functional, that is that the narrowing or distortion is not caused by anatomical change (fig. 4). Neither is it

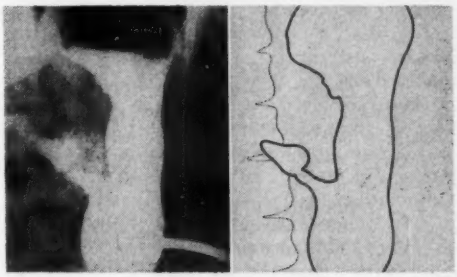


Figure 4. Spasm of pyloric antrum with ulcer above.

in keeping with the gastroscopic picture for, in this series, when an ulcer was seen above the angulus the antrum appeared normal or occasionally slightly edematous.

It is this antral spasm which produces a physiological obstruction to the free passage of gastric juice over the mucosa of the stomach and it is this interference with the rate of flow of gastric juice which leads to the development of an ulcer immediately above the obstruction.

This is not an isolated example of ulcer occurring above an obstruction in the stomach. An ulcer, for example, is sometimes seen in the sac of an hiatal hernia above the point of narrowing. A rarer example is that of a posterior wall ulcer in the body of the stomach associated with a contraction ring at the same level. I observed on four occasions in this series such a contraction ring running from the anterior wall across the greater curvature on to the posterior wall with an ulcer just proximal to it. In each case the ulcer was seen more easily than expected as it lay just proximal to the contraction ring which drew it into the visual field and turned it to face the objective of the instrument. A still rarer deformity seen twice in this series is hour-glass stomach. Ulcer associated with the obstruction in this condition may heal and a recurrence is always at or above the obstruction; it is never below. Lastly there is the example of pyloric obstruction due to a scirrhous carcinoma of the pylorus associated with a benign ulcer above on the lesser curvature; such a combination was seen twice in the present series.

The Acute Gastric Ulcer

Aschoff [11] described two types of erosion in the stomach. The first consisted of numerous small erosions thickly strewn over the mucous membrane. They occurred on the folds of the mucous membrane of the fundus and of the body of the stomach. particularly in the region of the greater curvature, so that a large area of the surface of the stomach was covered by them. In spite of this wide distribution they were given the name "fundic erosions." They were about the size of a pin's head and were usually haemorrhagic, hence their alternative name "haemorrhagic erosion." Aschoff considered that these "fundic erosions" were the result of venous stasis and spasmodic contraction of the musculature of the stomach. As distinct from these Aschoff described a larger type seen on the gastric pathway and its projection into the pyloric antrum. These occurred in smaller numbers, three or four at a time. They were either pale or haemorrhagic and on section were deeper than the "fundic erosions"; he called them the "erosions of the gastric pathway."

Aschoff deals only with pathological differences. The clinical differences are no less striking. "Fundic erosions" occur as a terminal event and are found post-mortem, their presence being suspected when a haematemesis complicates the last stage of a severe illness. Cleland [12] of South Australia has described their association with various conditions such as meningitis, arteriosclerosis and emphysema, congestive cardiac failure from chronic rheumatic carditis, coronary atheroma and bronchopneumonia. The "erosions of the gastric pathway" may be diagnosed during life and may produce a familiar syndrome seen in the busy executive and the harassed professional man. It is a malady of switchboard and car. It is the story of chronic gastric ulcer in miniature. The pain is similar in nature and relieved in the same way by milk or alkali. There is similar tenderness in the epigastrium but the degree of pain and tenderness is less than in chronic gastric ulcer. The cardinal feature is the short duration of the attack; it lasts not for three or four weeks but for three or four days. It has gone by the time he has made up his mind to seek medical advice and so it is rarely investigated. A classical example is the following: A professional man, aged 32 years, over a period of nine months had had several attacks of epigastric pain and tenderness which had been investigated by means of a barium meal on two occasions without disclosing the cause. A gastroscopic examination was made during an attack and on the anterior wall of the pyloric antrum just above the greater curvature was a small erosion with a yellowish base and a hyperemic margin. Just proximal to the musculus sphincter antri on the anterior wall of the stomach was another small erosion. The patient was asked to indicate any tenderness when his stomach was palpated during the examination. The identation caused by the palpating finger could be seen through the gastroscope and as the erosion on the anterior wall of the stomach just proximal to the antrum was touched the patient indicated that it was tender. An examination by means of a barium meal carried out by the radiologist immediately afterwards demonstrated a small niche at the expected site.

Characteristic of chronic gastric ulcer is a long history of dyspepsia which mounts in a series of attacks of pain followed by periods of freedom from pain. Gutmann [10] has pointed out that if we go back far enough in the patient's history there must come a time when we reach the first attack and that this attack is unique in that there is no previous history of dyspepsia on which this ulcer pain is superimposed and that

Figure 5. An acute ulcer on the posterior wall of the stomach.

even in this first attack the radiological signs can be demonstrated.

Figure 5 is the X-ray of a patient after a barium meal who presented with this train of symptoms and in whom a clinical diagnosis of acute ulcer was made. The radiologist, the late John O'Sullivan of Melbourne, gave a barium meal and showed a small linear fleck on the posterior wall; and at gastroscopy a linear erosion was seen at the point he had indicated and another small erosion was found in the antrum. In order to demonstrate these ulcers either by barium meal or gastroscopy it is necessary to make these examinations while the patient still has symptoms as these ulcers heal quickly. These acute ulcers may cause hematemesis and on X-ray examination with barium meal no ulcer is demonstrated, as the X-ray is usually deferred for some days after the bleeding has ceased, by which time the ulcers have healed. Dr. O'Sullivan told me that in less than 50% of patients who had had hematemeses was he able to demonstrate the causes by X-ray.

A perforation is not an uncommon complication in acute ulcer. It is of interest to record that Devine [13] of Melbourne reported that "in practically all the cases upon which I have operated for a perforated gastric ulcer, I have found that the patient has had no previous painful dyspepsia; that is, he has had no clinical indication of a chronic ulcer prior to the perforation, and I have regarded this as evidence that the majority of gastric perforations have occurred in acute or subacute ulcers." It is possible that such an acute ulcer placed above the incisura and exposed to the prolonged action of gastric juice is the forerunner of a chronic ulcer in this situation.

Petechial Hemorrhages in Gastric Mucosa

Schindler [14] states that mucosal hemorrhages are seen more often in an ulcer-bearing stomach than in a normal stomach. In this series petechiae of the mucous membrane were seen only 26 times. These petechiae were seen along the lesser curvature and adjacent parts of the anterior and posterior walls of the stomach as far as the angulus and were scattered also over the pyloric antrum; that is to say, their distribution and that of chronic ulcer are the same. In six cases the hemorrhagic spots were single; in the majority of the remainder three or four were seen and in one case six. They appeared to be distinct from the ulcer itself; for example, an ulcer in the antrum might be associated with a hemorrhagic spot on the lesser curvature above the angulus, or an ulcer in the latter position with a hemorrhagic spot higher on the lesser curvature. The petechiae were separated from the ulcer by mucosa which appeared normal through the gastroscope and in half the cases they were seen in patients who had an ulcer, active or healed. In the latter case the pigment spots were observed in the course of serial gastroscopic examinations made to observe the course of gastric ulceration.

In six of the remaining cases a duodenal ulcer was present and in one case petechiae were seen in association with a jejunal ulcer which had occurred following gastroenterostomy. Several times when petechial spots were seen a further gastroscopic examination was made a week later to see whether the lesion had broken down and become an acute ulcer. Had such a change occurred it would suggest that it was the analogue of the fibrinoid degeneration in the gastric muscosa described by Aschoff; [15] this was never observed. Although the numbers were too small to admit of proof, the impression gained from these observations was that petechial spots occur in an ulcer-bearing stomach.

Difficulties in Gastroscopy

In the writer's experience there are several reasons for the difficulty in diagnosis of ulcer in the pyloric antrum with the gastroscope. Firstly, those ulcers which are juxtapyloric and which should be easy to see are not always seen, as a contraction ring may form proximal to them and peristaltic waves pass down to this pseudopylorus which contracts like the genuine pylorus. On only one occasion in this series was an ulcer seen on the pylorus, the relevant part of the report in that case being, "there was a benign ulcer on the lip of the pylorus; it was occluded when peristalsis became vigorous and it was not seen again; there was no gastritis in the antrum, only a strip of adherent mucus on the angulus." Secondly, those ulcers which are situated in the pyloric canal are never seen, presumably for the same reason. (The pyloric canal is, by definition, that part which passes through the pyloric sphincter and joins the distal extremity of the antrum to the duodenal cap.) Thirdly, in benign pyloric obstruction the gastroscopic findings are disappointing in that the pylorus

itself is usually not seen. One of the reasons for this is that when air is injected into the capacious stomach of pyloric obstruction it first seeks the antrum; this fills and the pylorus is carried away from the objective of the instrument into the distance. Another reason is the distortion associated with chronic duodenal ulcer. Hurst and Stewart [16] showed that, in 64 per cent of deaths associated with obstruction from peptic ulceration, the ulcer was in the duodenum and in only 16 per cent of cases in the stomach. The duodenal ulcer causing obstruction is usually an adherent one on the posterior wall. As it scars it draws the pylorus towards itself. All that can be seen through the gastroscope is a greatly dilated stomach, in which may be seen vigorous peristalsis commencing high on the stomach wall and moving down to the pyloric antrum; this curves upwards and backwards towards the pylorus which remains beyond the visual field.

It is well known that ulcers situated on the lesser curvature of the pyloric antrum immediately behind the angulus are not seen, though these may produce Henning's sign, tenting of the angulus. Finally, as the gastroscope lies on the posterior wall of the stomach the view obtained of the

Figure 6. The tangential view often obtained of an ulcer on the posterior wall of the antrum.

posterior wall of the pyloric antrum is a tangential one and an ulcer in this situation can be overlooked in the foreshortening of this area which occurs when it is viewed through the gastroscope (fig. 6). Ulcers in this situation are often shallow and lack the oedema of the surrounding mucous membrane which is seen with ulcers occurring higher in the stomach. Because of these factors, the writer has several times missed an ulcer in this situation.

The difficulties in gastroscopic examination of the antrum are those due to the distance of the lesion from the gastroscope; those on the upper third of the stomach are, by contrast, due to the closeness of the lesion to the objective of the instrument. Moutier in his series states that gastric ulcers begin 3 or 4 cm. below the cardia on the lesser curvature and adjacent posterior wall. Such has been the writer's experience. Ulcers which occur high on the posterior wall of the stomach escape detection as the gastroscope rests on the posterior wall of the stomach throughout the examination, and remains in contact with this part in particular right up to the time that it is withdrawn from the stomach through the cardia at the end of the examination. For this reason it is often impossible to make an authoritative distinction where the question of an ulcer or diverticulum arises from the X-ray. Ulcers on the upper third of the lesser curva-

Figure 7. An antero-posterior film has been taken with the patient lying on the left side. The gastroscope has been introduced and the stomach has been moderately distended with air. The upper part of the lesser curvature falls against the instrument.

ture also are difficult to see as, when the patient assumes the left lateral position, the liver falls slightly over to the left, and carries with it the upper part of the lesser curvature. This falls against the objective of the instrument and remains there despite the injection of air (fig. 7). One appreciates this alteration in the lesser curvature when a gastroscopic examination is made on some cases of ulcer in which X-ray shows a niche just above the incisura angularis; on gastroscopy the ulcer is not found where expected, but it is appreciably higher, a condition which suggests an elongation of the lesser curvature.

There may be difficulty in seeing an ulcer on the posterior wall of the stomach. The distension of the stomach with air for the examination lifts the anterior from the posterior wall without producing an un-

folding of the mucous membrane of the posterior wall. Thus an ulcer in the latter situation may remain embedded in these folds and escape detection. Another cause of an ulcer remaining embedded in mucosal folds is muscle spasm. Figure 8 shows an ulcer on the posterior wall of the stomach;

Figure 8. Ulcer on the posterior wall of the stomach. A. Almost obscured by mucosal folds. B. Thirty seconds later relaxation has occurred and the floor of the ulcer is now visible.

immediately after the introduction of the gastroscope the ulcer is seen almost obscured by the mucosal folds; thirty seconds later relaxation has occurred and the floor of the ulcer is clearly visible.

Ulcer and Gastritis

The writer's interest in the association of gastritis with gastric ulcer was stimulated by Devine [13] of Melbourne who put forward the hypothesis that stimulation of the "tension receptors" in the stomach wall produces the pain in chronic ulcer. He considered that this stimulation was due in part to the infiltration of the stomach wall in the vicinity of the ulcer with inflammatory cells and in part to the added tension caused by muscle movement. He held that it was the active process of gastric emptying which gave rise to the pain in chronic gastric ulcer and that the tension stimulus adequate to produce pain is brought on by vigorous peristaltic movement and muscular contraction as the stomach empties itself. He postulated that the relief of pain from chronic gastric ulcer which follows the taking of food or alkaline drinks is due to the distension of the stomach, and that pain in gastric ulcer is a concomitant of the emptying phase. From observation of the mucous membrane of the stomach made at operation, Devine was led to believe that gastritis was the forerunner of ulcer and with this in mind the writer paid particular attention to the appearance, during gastroscopy in cases of ulcer, of the remainder of the mucous membrane of the stomach. The criteria applied to the gastroscopic diagnosis of gastritis were essentially those of Schindler. In the present series it was found that in 28 cases the ulcer was situated in a normal mucous membrane, with no evidence of gastritis, whereas in the remaining 92 cases the mucosa surrounding the ulcer had lost its sheen and was oedematous, hyperemic and nodular. This abnormality was confined to the region of the ulcer and did not extend over the whole of the gastric mucosa. In a sequence of gastroscopic examinations of ulcers, carried out in some cases over a period of a year or more, it was found that the gastritis varied and in some cases disappeared even though the ulcer was still present. This suggests that the gastritis is not a primary condition on which an ulcer becomes superimposed. The gastritis surrounding the ulcer is often very much like chronic superficial gastritis as described by Schindler. In Melbourne I have not seen chronic superficial gastritis as a disease entity but only as a phenomenon secondary to some other gastric disorder such as carcinoma, chronic ulcer or surrounding the stoma in the post-operative stomach. The late Leo Doyle [17] of Melbourne reported that, seen in microscopic section, ulcer in the resected stomach was always associated with gastritis, the changes being spread along the lesser curvature and the antrum and varying in intensity at different points. In the writer's series, when sections of the antrum were made after gastrectomy for an ulcer, histological changes were frequently found. These changes were mainly mucosal and consisted of collections of plasma cells and lymphocytes in the mucosa with sometimes dilatation of the glands in the more superficial parts, vascular congestion in the submucosa and some thickening of the muscle coat. Andrew Brenan, pathologist, of Melbourne, stated that he did not know the significance of these changes; but it is a fact that in these cases the mucous membrane is normal or at the most shows only slight oedema when viewed through the gastroscope. Another lesion I have never seen in Australia is the chronic erosive gastritis of the pyloric antrum associated with gastric ulcer as described by Faber [18] and Konjetzny; [19] nor have I seen the association of chronic hypertrophic gastritis and chronic ulcer as described by some authors. Chronic hypertrophic gastritis is itself a distinct rarity

and occurred only six times in the present series.

Gastric Ulcer and Diverticulum

On three occasions the writer has seen an unusual deformity accompanying a chronic ulcer of the stomach in which there is disappearance of the lesser curvature of the pylor-

Figure 9. Gastric diverticulm. Gastroscopic appearance with pylorus on lesser curvature above the pouch.

ic antrum and elongation of its greater curvature, so that a pouch develops from the elongated greater curvature of the antrum immediately below the pylorus. The pylorus, itself, lies on what appears to be the lesser curvature of the stomach (fig. 9). When the writer saw this deformity for the first time he mistook for the antrum the pouch projecting to the right, as it occupied the normal position of the antrum; only as the gastroscope was being withdrawn was the pylorus seen on the lesser curvature above the pouch. In each case an ulcer was present on the posterior border of the lesser curvature just above the pylorus. Schindler [20] has described the gastroscopic appearances of a similar deformity brought about by healing of a gastric ulcer with scar formation; this caused a shortening of the longitudinal muscle fibres of the lesser curvature, pulled the angulus and pylorus upwards and backwards so that they were seen a short distance below the cardia and led to the development of a large pouch in the dependent portion of the pyloric antrum. Gutmann has described the radiological appearances of the development of such a pouch in gastric decompensation in pyloric

Figure 10. Gastric diverticulm. X-ray appearance of the pounch projecting to the right.

obstruction (fig. 10). He points out that the first sign of gastric dilatation occurs in the immediate sub-pyloric segment of the stomach, that is the greater curvature of the antrum which, in the course of successive examinations, projects more and more to the right; he calls this "the thrust towards the right." Only later does there occur the downward dilatation of the stomach that is commonly associated with pyloric

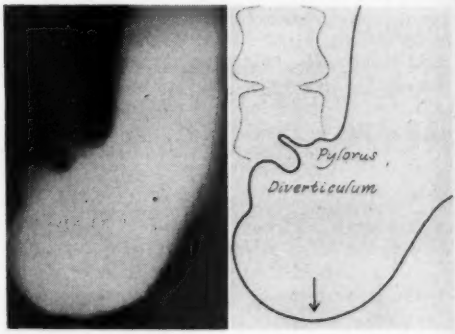


Figure 11. Later stage with added dilatation downwards.

obstruction (fig. 11). Templeton [21] has described the "rolling-in" of the pylorus seen radiologically and the development of a pseudo-pouch from the greater curvature of the antrum caused by contraction from an ulcer on the lesser curvature of the stomach. The writer does not consider that this is a pseudo-pouch but a true diverticulum analogous to the prestenotic diverticulum seen immediately proximal to ulcer of the duodenum.

Such a deformity does not occur if the antrum is the site of carcinoma or ulcer. In other words, it can be produced only by a normally functioning antrum.

Summary

The findings are analyzed in 120 cases of gastric ulcer in 1200 consecutive gastroscopic examinations made in Melbourne, Australia. The situation of gastric ulcer found at gastroscopic examination is com-

pared and contrasted with its position found post-mortem according to Wright-Smith of Melbourne. The role of spasm of the pyloric antrum as a factor in the etiology of ulcer and the relation of ulcer to gastritis and to the hemorrhagic "pigment spot" described by Schindler are discussed. The difficulties in obtaining a clear view of a gastric ulcer in certain situations, particularly in the upper third of the stomach, are pointed out. Stages in the development of a gastric diverticulum related to pyloric obstruction are described.

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